OPERATION AND SERVICE MANUAL

MODEL 1010D

DIGITAL OHMMETER

SERIAL NUMBER 117

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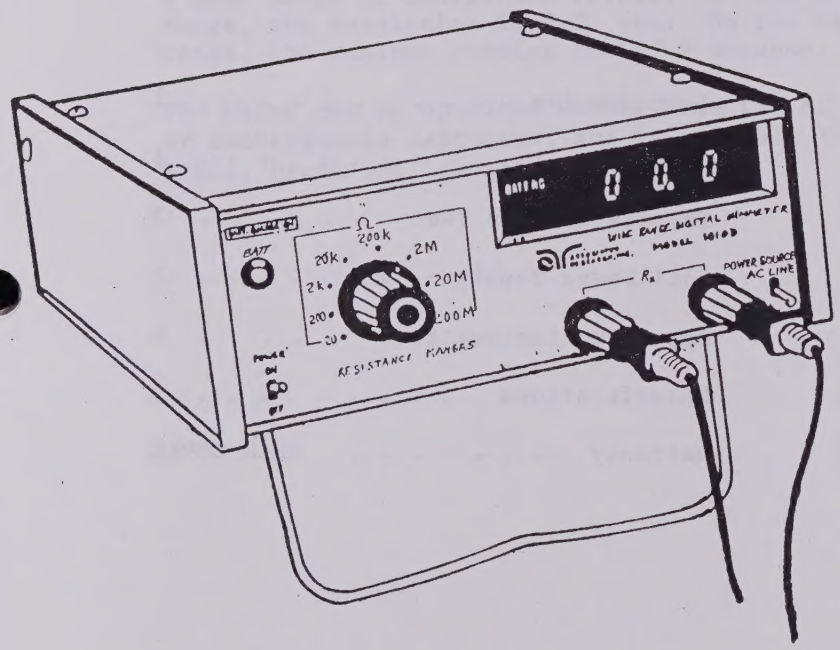
OPERATORS MANUAL

DIGITAL
OHMMETER



MODEL 1010D

ASSOCIATED
RESEARCH, INC.

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INTRODUCTION

The Model 1010D ohmmeter is designed to measure a wide range of resistance values. On the lowest range, the resolution is 0.01 ohm. On the highest range, the maximum reading is 199.9 megohms.

The meter can be operated either from the AC line or rechargeable batteries, and is suitable for field, bench and laboratory use.

SAFETY

Before preparing for a test and before operating the equipment, observe all safety rules. Be sure all safety gear is available and in good condition. When switches or breakers are opened for a test, be sure they are locked out and guards and safety signs are posted. Always test a disconnected circuit or apparatus for presence of voltage. Always apply a ground to a disconnected circuit before a test to prevent static charges.

PREPARATION FOR TEST

Take equipment or circuits out of service. Use a voltmeter to check between terminals and then apply a ground to be sure no voltage is present.

The equipment to be tested must be completely disconnected from the power source for safety and to prevent damage to the test equipment. In the case of rotating machinery, transformers, switches, etc., disconnect all leads. Inspect the wiring to determine exactly what will be included in the test. If switches or fuses are left in a circuit tested, they too will be tested and influence readings.

DUAL POWER SUPPLY

The Model 1010D can be operated from one of two sources:

BATTERY OPERATION

Four 1.2 Volt Nickel-Cadmium batteries are built in. When fully charged, they can provide up to 90 minutes of operation on the 20 ohm range (more on the other ranges). To operate from the batteries, set the Power Source switch to DC. The BATT light will flash, indicating that the ohmmeter is receiving its power from the batteries. When the BATT NG light indicates that the batteries need to be recharged, the line cord must be plugged in and the Power Source switch set to the AC position to charge the batteries. A full charge takes 15 hours, but the batteries will not be overcharged if left on charge for longer than 15 hours.

AC LINE OPERATION

To operate from the AC line, set the Power Source switch to AC and plug in the line cord. Operation in this mode will also charge the batteries whether the ohmmeter is being used or not. The AC LINE light indicates that the unit is being powered from the line.

OPERATING INSTRUCTIONS

CAUTION: BE CERTAIN THAT THE EQUIPMENT TO BE TESTED IS DE-ENERGIZED BEFORE ATTEMPTING TO MAKE ANY MEASUREMENTS.

To measure resistance:

1. Check for voltage to make sure the equipment to be tested is de-energized and apply a ground to be sure no static charge is present.

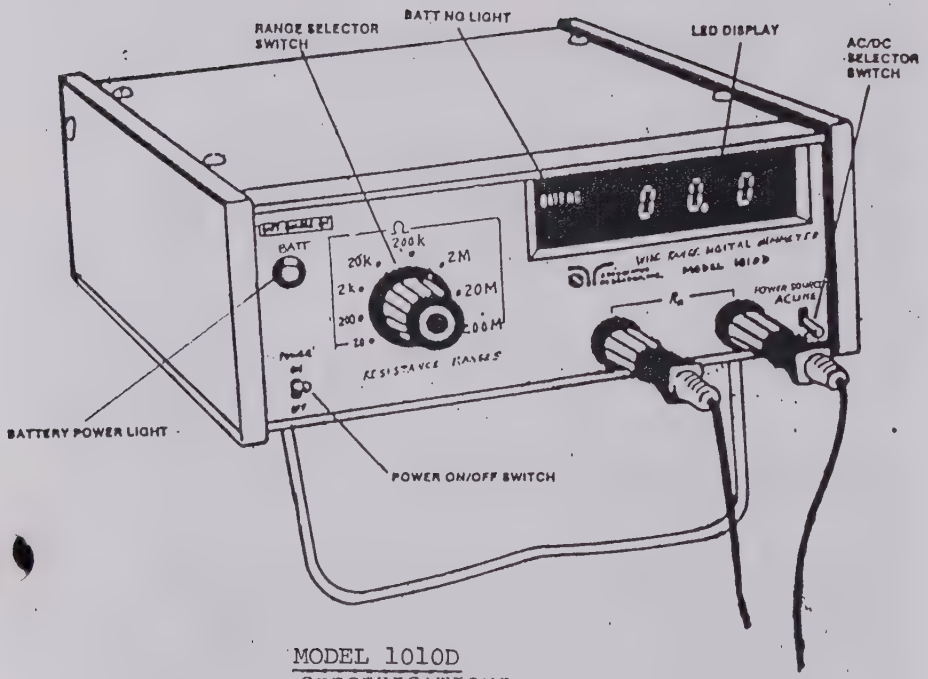
2. Select the desired power source, AC or DC.

3. Set the range selector switch to the desired range.

4. Connect the test leads to the measuring terminals.

5. Turn the power switch on. The display should show the overrange condition with the first "1" lit and all other digits blanked.

6. Connect the test leads to the item being tested. The resistance value will be indicated on the LED display.



MODEL 1010D
SPECIFICATIONS

RANGE	DISPLAY	RESOLUTION	CURRENT	ACCURACY
20 Ohms	0-19.99 Ohms	.01 Ohms	10 mA	±0.3%RDG±0.2% FS
200 Ohms	0-199.9 Ohms	.1 Ohms	1 mA	" "
2 k	0-1.999 kOhm	1 Ohm	100 uA	" "
20 k	0-19.99 kOhm	10 Ohms	10 uA	" "
200 k	0-199.9 kOhm	100 Ohms	1 uA	" "
2 M	0-1.999 MOhm	1 kOhm	0.1 uA	" "
20 M	0-19.99 MOhm	10 kOhm	0.01 uA	±0.5%RDG±0.2% FS
200 M	0-199.9 MOhm	100 kOhm	0.001 uA	± 10% FS

Operating Temp. Range:
5C - 35C

Power Source:
AC main 120V AC or rechargeable nicad system

Model 1010DA 230V AC or rechargeable nicad system

Guaranteed Accuracy:
If calibrated every 180 days and operated from the AC line between 15C and 30C.

Size: 7"x3-1/8"x9-3/8"
(175 x 80 x 235 mm)
Weight: 5 lbs (2.3 kg.)

DIGITAL OHMMETER LIMITED WARRANTY

This new Digital Ohmmeter is warranteed to be free from defects in workmanship and material for one year from the date of shipment, provided there is no evidence of modifications, tampering or physical damage. Bypassing any safety systems will void this warranty.

THIS WARRANTY DOES NOT COVER TUBES, BATTERIES OR ACCESSORIES NOT OF ASSOCIATED RESEARCH MANUFACTURE.

Any unit found defective under this warranty will be repaired free of charge if returned to the factory prepaid and insured.

EXCEPT AS PROVIDED HEREIN, ASSOCIATED RESEARCH MAKES NO WARRANTIES TO THE PURCHASER OF THIS UNIT AND ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, (INCLUDING, WITHOUT LIMITATION, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE) ARE HEREBY EXCLUDED, DISCLAIMED AND WAIVED.

To avoid delay, before returning the instrument for repair, you must first contact Associated Research for authorization and shipping instructions.

Manual No. 35683A
SN 0126-UP

SCHEMATIC

REVISIONS						REV STATUS OF SHEETS	
SYM	DESCRIPTION	ECO #	DATE	APPD	CHK	SH	REV
						1	
						2	
						3	
						4	
						5	

R67 200Ω 1/4W 5%

TP 3

2kΩ 200kΩ 2MΩ 200MΩ

S3-2

TP 4

-5V

IC4 ICL 7621

D8 ICL 8009

R72 1K 1/8W 5%

25K30

IC4

R70 1M 1/8W 5%

TP 5

S3-1

PCB SCL-101

PCB 2P1L02

47Ω 1/4W 5%

R63 2kΩ

3kΩ 20kΩ 200kΩ 2MΩ 20MΩ

PCB 2P1L01

+5V

R1-R83 1kΩ 1/8W 5%

IC1 ICL7107

P41 100Ω 1/8W 5%

Q3 2SA1015

Q4 2SC1815

PCB AD2.5

+5V

LED5 SSL-58HD

PL

Q1 2SJ649

D1 1S4448

R32 10k 1/8W 5%

FET1 2SK30A

1dp 10dp 100dp

1MΩ 200kΩ 20kΩ 2kΩ 200Ω 20MΩ

1K 1/4W 1%

200mΩ 20Ω

S3-3

F1 1A

115V 230V

SCL-101C

T1

115V 8V 400mA 115V 7V 50mA

S1-1

WDBM D6 WDBM D7

R73 28Ω 1/2W 5%

D4 1S4448

RDG 6E B3

BATT

S2-2

P1 Ni-CD BATTERY 4.8V 500mAh

S1-2

TP6

+5V

IC8 TC4011BP

1/4 MC14011

1/4 MC14011

R49 680K 1/4W 5%

R50 3.3K 1/4W 5%

C5 .047

R48 1K 1/4W 5%

Q4 2SC1815

C6 .047

C8 100µF 16V

IC7 TC4053BP

C7 .047

C9 10µF

C10 10MF 25V

R51 10k

D3 1S4448

R52 1K 1/8W 5%

TP7

P1

NOTES SPECIFIC

1. REMOVE ALL BURRS AND SHARP EDGES, NICKS, AND SCRATCHES.

NOTES GENERAL UNLESS OTHERWISE SPECIFIED AND AS APPLICABLE

ITEM #	QTY REQD	PART NUMBER	DESCRIPTION OR NOMENCLATURE	NOTE
MATERIALS OR PARTS LIST				

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES

USED ON MODEL/ ASSY 1010D

NEXT ASSY NUMBER

HEAT TREAT | FINISH

SYMBOLS ▷NOTES □PARTS LIST ITEM NUMBER

DRAWN | CHECKED D.H.D | APPROVED

ASSOCIATED RESEARCH, INC.

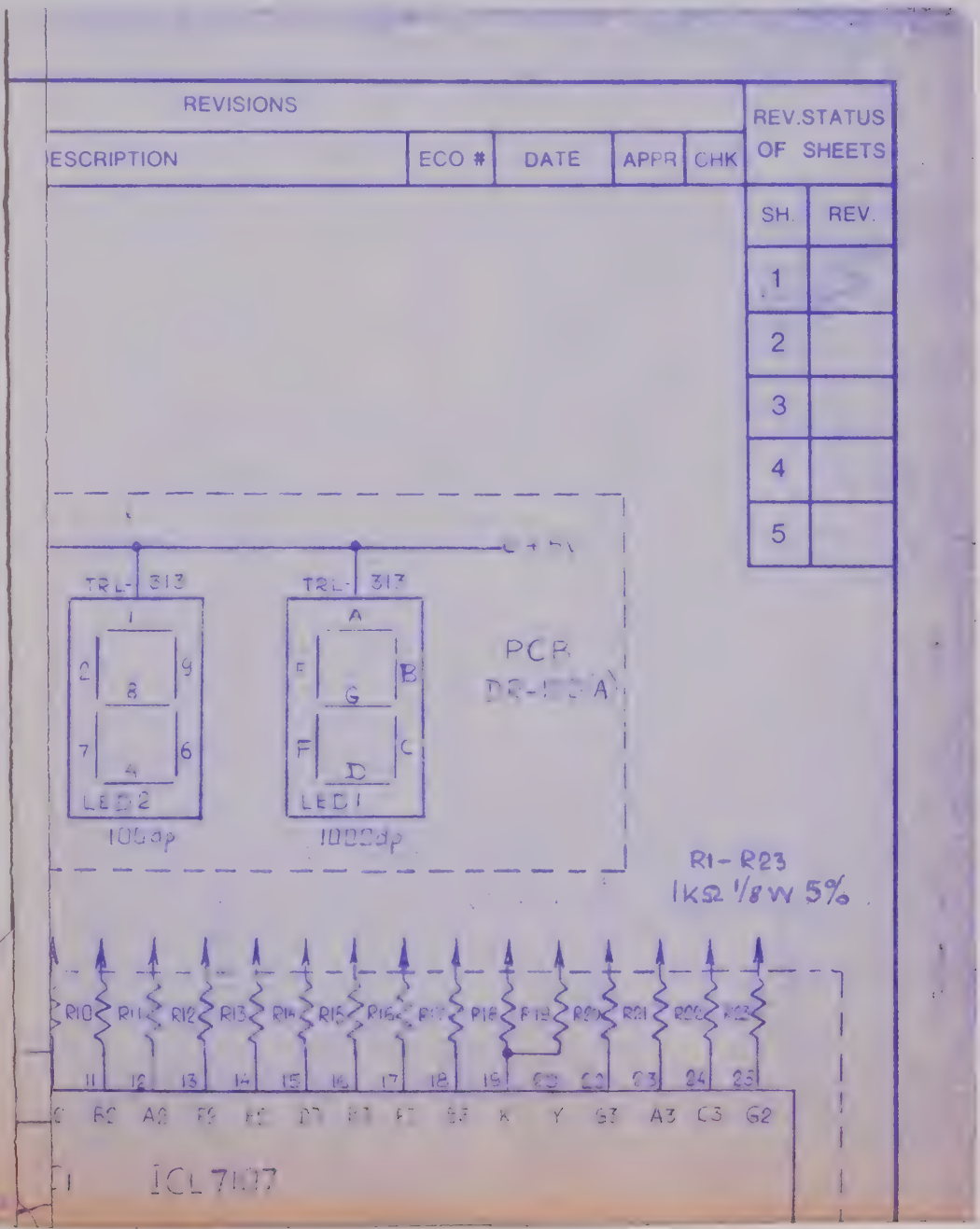
WIDE RANGE DIGITAL OHMMETER

SCHEMATIC WIRING DIAGRAM

SIZE C | S 0 1 0 1 0 D

SCALE # | WT | SHEET 1 OF 1

REVISIONS					REV.STATUS OF SHEETS	
ESCRIPTION	ECO #	DATE	APPR	CHK	SH.	REV.
					1	
					2	
					3	
					4	
					5	



REPLACEMENT PARTS LIST

To order replacement parts, refer to the Replacement Parts List on the following pages. If you need assistance, call our Technical Support Hotline 1-800-858-TEST.

REVISIONS						REV. STATUS OF SHEETS	
SYM	DESCRIPTION	ECO #	DATE	APPR	CHK	SH.	REV.
						1	
						2	
						3	
						4	
						5	

SYMBOL	P/N	DESCRIPTION		QTY
B1	77014	BATTERY Ni-CD 4.8V 500mAh		1
C1, C2		CAPACITOR, MYLAR	.22μF	2
C3		CAPACITOR, MYLAR	.1μF	1
C4		CAPACITOR, CERAMIC DISC,	100pF	1
C5, C6, C7		CAPACITOR, CERAMIC DISC,	.047 μF	3
C8		CAPACITOR, ELECTROLYTIC,	100μF, 25V	1
C9, C10		CAPACITOR, ELECTROLYTIC,	10μF, 25V	2
C11		CAPACITOR, ELECTROLYTIC,	100μF, 25V	1
C12		CAPACITOR, ELECTRDLYTIC	1000μF, 25V	1
C13		CAPACITOR, POLYESTER FILM,	.047μF, 630V	1
D1, D2		DIODE, SILICON, 1S4448		2
D3		DIODE, ZENER, RD 4.3E B1		1
D4		DIODE, SILICON, 1S4448		1
D5		DIODE, ZENER, RD 6.8E B3		1
D6, D7		DIODE BRIDGE TYPE, W02M		2
D8		VOLTAGE REFERENCE, ICL 8069		1
F1		FUSE, 1A 250V 5X20mm		1
FET1, FET2		TRANSISTOR, 2SK30		2
IC1		IC, ICL 7107		1
IC2		IC, MC14011 OR MSM4011		1
IC3		IC, ITS 60953 OR ICL 7660		1
IC4		IC, ICL 7621		1
LED1-3	77101	TRL-313		3
LED4	77102	TRL-314		1
LED5	77103	DI6-58R		1
P1		RECEPTACLE, 250VAC 6A MALE		1
Q1		TRANSISTOR 2SB642		1
Q2		TRANSISTOR, 2SA 1015		1
Q3		TRANSISTOR, 2SC 1815		1
Q4		TRANSISTOR, 2SD 637		1
R1-R23		RESISTOR, FXD,	1KΩ, 1/8W, 5%	23
R24		RESISTOR, FXD,	10KΩ, 1/4W, 5%	1
R25		RESISTOR, FXD,	100KΩ, 1/4W, 5%	1
R26		RESISTOR, FXD,	3.3KΩ, 1/4W, 5%	1
R27		RESISTOR, VARIABLE	100Ω	1
R28		RESISTOR, FXD,	5.1KΩ, 1/4W, 5%	1
R29		RESISTOR, FXD,	100KΩ, 1/8W, 5%	1
R30		RESISTOR, FXD,	20KΩ, 1/8W, 5%	1
R31, R32, R33		RESISTOR, FXD,	10KΩ, 1/8W, 5%	3
R34		RESISTOR, FXD,	51KΩ 1/4W, 5%	1
R35		RESISTOR, FXD	390KΩ, 1/4W, 5%	1

SYMBOL	P/N	DESCRIPTION		QTY
R36		RESISTOR, FXD,	100KΩ, 1/8W, 5%	1
R37 – R40		RESISTOR, FXD	10KΩ, 1/8W, 5%	4
R41		RESISTOR, FXD	100KΩ, 1/8W, 5%	1
R42 – R45		RESISTOR, FXD	1KΩ, 1/8W, 5%	4
R46		RESISTOR, FXD	10KΩ, 1/8W, 5%	1
R47		RESISTOR, FXD	3.9MΩ, 1/8W, 5%	1
R48		RESISTOR, FXD	680KΩ, 1/8W, 5%	1
R49 – R50		RESISTOR, FXD	1KΩ, 1/8W, 5%	1
R51		RESISTOR, VARIABLE	10KΩ	1
R52		RESISTOR, FXD	4.7MΩ, 1/4W, 5%	1
R53		RESISTOR, FXD	4.3MΩ, 1/4W, 5%	1
R54		RESISTOR, VARIABLE	1MΩ	1
R55		RESISTOR, FXD	910KΩ, 1/4W, 5%	1
R56		RESISTOR, VARIABLE	200KΩ	1
R57		RESISTOR, FXD	91KΩ, 1/4W, 5%	1
R58		RESISTOR, VARIABLE	20KΩ	1
R59		RESISTOR, FXD	9.1KΩ, 1/4W, 5%	1
R60		RESISTOR, VARIABLE	2K	1
R61		RESISTOR, FXD	910Ω, 1/4W, 5%	1
R62		RESISTOR, VARIABLE	200Ω	1
R63		RESISTOR, FXD	82Ω, 1/4W, 5%	1
R64		RESISTOR, FXD	47Ω, 1/4W, 5%	1
R65		RESISTOR, VARIABLE	100Ω,	1
R66		RESISTOR, FXD	100Ω, 1/4W, 5%	1
R67		RESISTOR, FXD	200Ω, 1/4W, 5%	1
R68		RESISTOR, VARIABLE	2KΩ	1
R69		RESISTOR, FXD	1KΩ, 1/4W, 5%	1
R70		RESISTOR, FXD	1MΩ, 1/8W, 5%	1
R71		RESISTOR, FXD	1.2KΩ, 1/4W, 5%	1
R72		RESISTOR, FXD	1KΩ, 1/8W, 5%	1
R73		RESISTOR, FXD	28Ω, 1/2W, 5%	1
RL	77407	RELAY, REED DG1A05		1
S1, S2	77023	SNAP SWITCH, MS-245		2
S3	77021	ROTARY SWITCH 3-3-12		1
T1	77016	TRANSFORMER, SCL-101C		1
V2		VOLTAGE REGULATOR, 78M05.		1
	77037	TEST LEADS (PAIR)		1

NOTES, SPECIFIC:

1. REMOVE ALL BURRS AND SHARP EDGES, NICKS, AND SCRATCHES.

NOTES, GENERAL, UNLESS OTHERWISE SPECIFIED AND AS APPLICABLE:

ITEM #	QTY REQD	PART NUMBER	DESCRIPTION OR NOMENCLATURE	NOTE
MATERIALS OR PARTS LIST				

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES
FRACTIONAL ± 1/64 DECIMALS ± .005 | ANGLES ± 1/2° | SURF FNSH ✓
HEAT TREAT | FINISH
SYMBOLS: ▷NOTES □PARTS LIST ITEM NUMBER

USED ON MODEL/ ASSY: 1010 D
NEXT ASSY NUMBER:

DRAWN	G. L.	5-21-84
CHECKED	DMD	6-21-84
APPROVED	R	6-18-84

ASSOCIATED RESEARCH, INC.

WIDE RANGE DIGITAL OHMMETER
SYMBOL IDENTIFICATION

SIZE C | SO1010D
SCALE / | WT | SHEET 2 OF

REVISIONS					REV. STATUS OF SHEETS	
ESCRIPTION	ECO #	DATE	APPR	CHK	SH.	REV.
					1	
					2	
					3	
					4	
					5	

QTY	
R, 1/8 W, 5%	1
37 1/8W, 5%	4
R, 1/8W, 5%	1
42 1/8 W, 5%	4
R 1/8W, 5%	1
R Ω, 1/8W, 5%	1
R Ω, 1/8W, 5%	1
24 1/8 W, 5%	1
R	1
R Ω, 1/4W, 5%	1
R Ω, 1/4W, 5%	1
R	1
R, 1/4W, 5%	1
R Ω	1
R 1/4W, 5%	1
R	1

MP MASTER
MA30068